The tendency to stress technique in algebra and logic in geometry seems to grow out of three sources:

1. It is generally believed that technique is more easily acquired by the immature student than logic, and traditionally algebra comes first in the high-school course;
2. Geometric figures form a more concrete basis for logic than algebraic symbols;
3. Elementary geometry has been bequeathed to this modern world as a monument of rigorous logic which too many feel it would be profane to treat in any other way.

From experience, observation and experiment I am convinced that the above tendency, whatever its cause, violates sound principles of teaching. Algebra and geometry should be taught side by side in the high school, not one before the other, and technique and logic should receive about equal stress throughout the course. Technique without logic and logic without action are alike foreign to the adolescent. It must, however, be borne strictly in mind that insistence upon difficult technique causes as many failures as insistence upon rigorous logic; both must be kept within the ability of the high-school student. In a word, the development of technique and logic should receive equal attention; the material for the development of technique should be simplified and enriched by the introduction of geometrical drawing and construction work; the logic sought should be the logic of the high-school student, not that of the expert logician; technique should gradually increase in fineness and logic in rigor as the course advances.

This procedure will aid to develop the power to understand the quantitative relations of the everyday world that confront the student and the ability to put this understanding into successful execution. The procedure of question 38 has a tendency to develop memorists in logic and jugglers in technique.

NEW QUESTIONS.

40. How great emphasis is laid in freshman mathematics upon the elementary algebra of complex numbers? A recent paper by an eminent electrical engineer seems to indicate the need of a knowledge of this subject on the part of draftsmen and mechanics of very limited educational opportunities. The syllabus of the College Entrance Examination Board mentions the topic under the caption "Advanced Algebra," but the question papers call for only the slightest study of numbers of this type. Is Euler's theorem ($e^{i\theta} = \cos\theta + i \sin\theta$) usually presented in college algebra, or is it left to the calculus? Does the topic deserve greater emphasis than it usually gets, for the sake of applications in the field of periodic currents?

41. A reader asks for an elementary proof of the following two propositions in number theory, either of which can readily be obtained from the other:

Every positive integer of the form $8n + 3$ is the sum of three odd squares.

Every positive integer is the sum of not more than three triangular numbers.

NOTE. Bachmann[1] states that these theorems have been proved only by the use of the theory of ternary quadratic forms, and refers to the discovery of the theorems by Gauss, and a comparatively simple proof by Dirichlet,[2] by means of this theory.—EDITOR.

DISCUSSIONS.

Professor Noble, discussing the familiar fact that the addition of two rational algebraic fractions each in its lowest terms, by the usual method of reducing to the least common denominator, may lead to a result not in its lowest terms, shows in what way this situation presents itself, and verifies the process suggested by one text-book for securing the result in reduced form. That a similar contingency may arise in arithmetic is clear to anyone who has performed the addition of $\frac{1}{2}$ and $\frac{1}{6}$.

Professor Johnson calls attention to a very simple formula for an approximation to the smaller acute angle of a right triangle in terms of the sides, in which the error is surprisingly small. The formula was given, as the author states,

[1] *Niedere Zahlentheorie*, Leipsic and Berlin, 1910, Teil 2, p. 325.

[2] *Crelle's Journal*, Vol. 40, p. 228; *Liouville's Journal*, Series 2, Vol. 4, p. 233.